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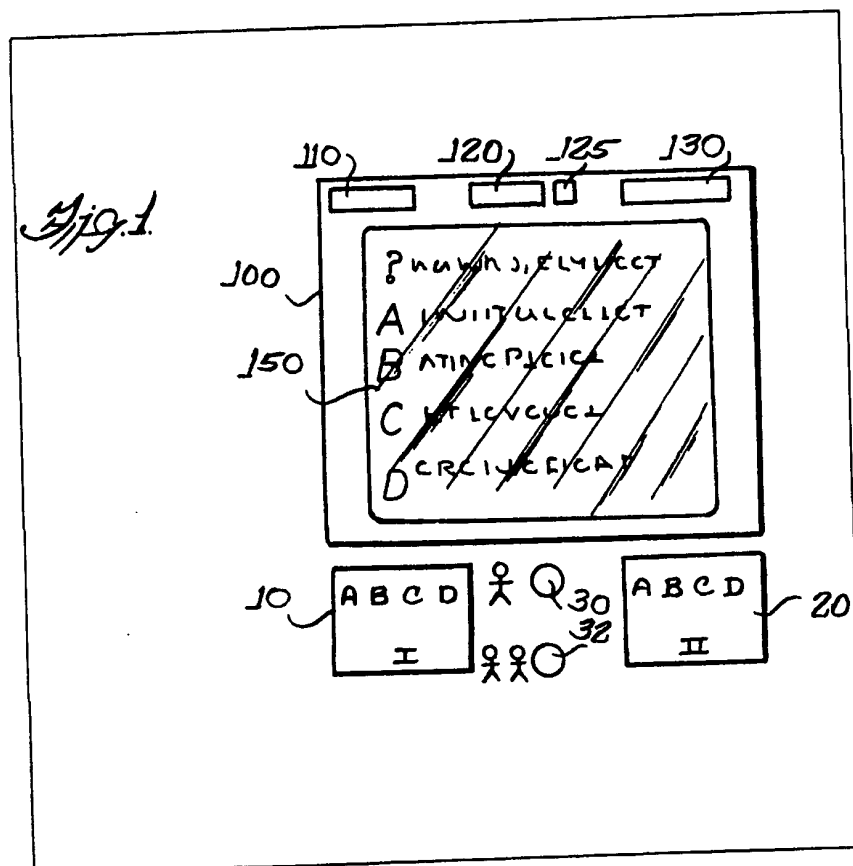
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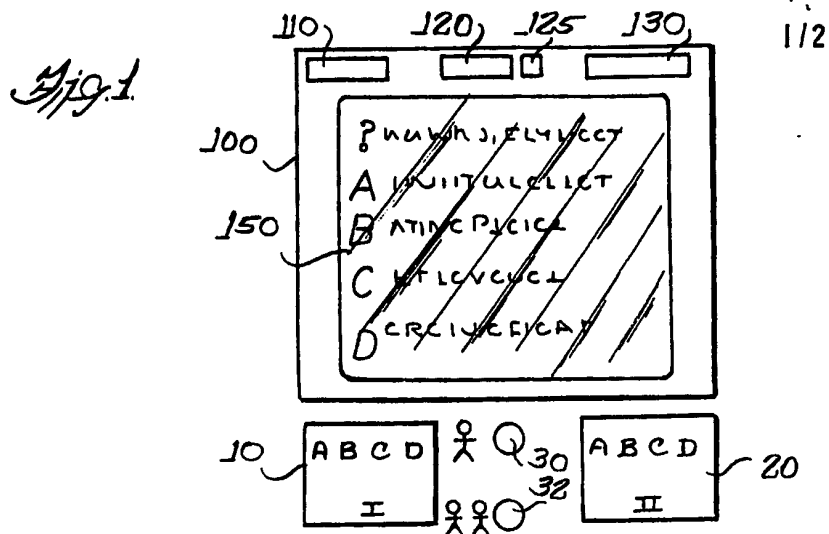
(54) Video question and answer  
apparatus

(57) The apparatus comprises means such as a keyboard (10, 20) for providing an input data signal, a control means for selectively providing a control signal responsive to the input data signal, memory for storing and outputting question and associated answers data responsive to the control signal, and means for providing a display presentation (150) of a question and associated answers responsive to the memory means output, the correct one of the associated answers being deducible directly from the display presentation of the question. Non-volatile storage means, such as an EP-ROM, cassette or disk, can be provided for storing additional question data and associated multiple choice answers which can be selectively

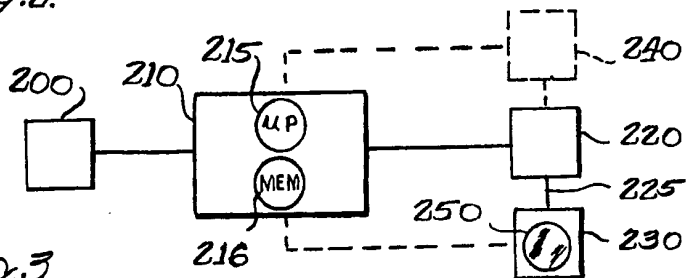
output to and stored in the memory means of the video game system. Scoring may be effected responsive to the number of correct answers, and can be made dependent upon the elapsed time taken to correctly answer the presented question and/or the number of incorrect choices. Means can be provided for animating the display presentation of the question and answers.



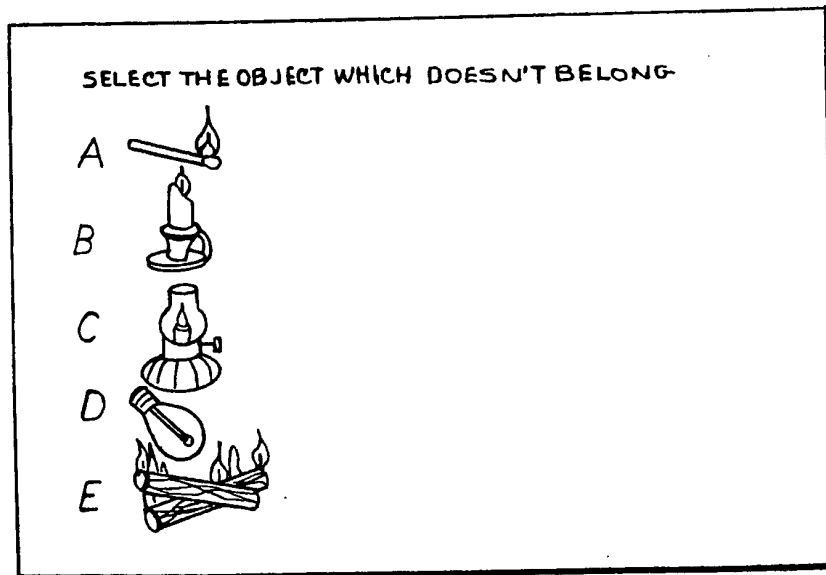
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*Fig. 2*



*Fig. 3*



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Fig. 4.

212

HOW MANY FIGURES HAVE NO HAIR?

- A 5
- B 6
- C 7
- D 8

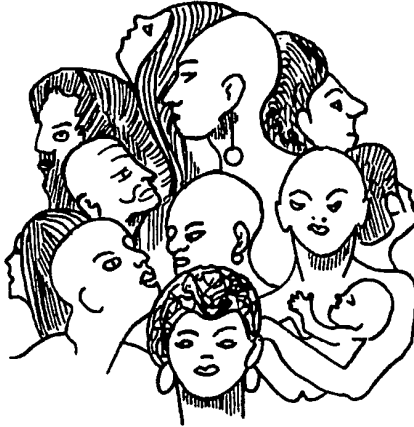


Fig. 5.

WHAT SEGMENT COULD COMPLETE THIS RECTANGLE?



- A
- B
- C
- D
- E

## SPECIFICATION

## Video question and answer game

- 5 This invention relates to video games and more particularly to video games having self contained memory for storing and outputting question and associated multiple choice answers and means for interacting with a user.
- 10 Prior question and answer game systems have utilized electromechanical systems, such as stepping switches, film projectors, etc. Other teaching, educational, and quiz game apparatus have utilized manually assisted electronics. In one such apparatus, a series of
- 15 images and words on a card are placed on a light box. In another apparatus, a series of questions and multiple choice answers are manually presented on a sheet of paper or other substrate, and a question code and selected answer are fed to a microprocessor for scoring, such as shown in Goldfarb, U.S. Patent No. 4,164,078. Another apparatus utilizes a separate question and answer sheet
- 25 with a corresponding activator strip which can be inserted into an educational device having user actuatable keys and a display. The display provides an indication of yes or no responsive to a depressed answer key responsive to the user activated key and the activator strip (program selector means) and control logic, as taught in Erilakis, U.S. Patent No. 4,118,876. Still another apparatus utilizes a
- 30 set of question and answer cards containing visual information on the front, and audio and digital magnetically recorded information on the back which represents the subject matter to be learned. The questions on the cards are reviewed by a student. The computer displays
- 40 whether a student selected answer is correct or incorrect. The computer then tallies the total number of items done, and the number of items done correctly. Such a system is taught in Sachs, U.S. Patent No. 3,981,087.
- 45 Another approach, is disclosed in Bender, U.S. Patent No. 3,609,878, for a reading/teaching machine for preschool children, comprising a continuous sheet containing visual information representing a plurality of frames.
- 50 A picture and multiple descriptive words are provided for each frame, and the child is thereby taught correlation of printed words to the visuals of previously known objects. The sheet advances to the next frame when a
- 55 correct answer is chosen.
- A prior coin operated quiz game, named Super IQ, utilized a question and multiple choice answer format using a film projector with a continuous film strip and other electromechanical circuitry, such as disclosed in U.S. Patent No. 3,765,105. The Super IQ game allowed the user to select a subject area for questioning but required the user to have detailed previous knowledge of the subject
- 60 area to correctly answer the questions.

- These prior approaches have numerous shortcomings and have received only limited acceptance for numerous reasons. First, these apparatus, except Super IQ, require human
- 70 manual intervention, and require externally supplied physical data sheets to properly operate. Further, the apparatus embodying all of these systems are electromechanical and subject to wear and breakdown. Additionally, all
- 75 of these systems require prior knowledge of the subject matter, or luck, to correctly answer a display question. Furthermore, none of these systems or apparatus provided animation to amuse and captivate the user.
- 80 In accordance with one aspect of the present invention, a video quiz game system is described, comprising a user input apparatus, such as a keyboard, for providing an input data signal responsive to a user supplied
- 85 stimulus, control means for selectively providing a control signal responsive to the input data signal, memory for storing and outputting question and associated answers data responsive to the control signal, and means for
- 90 providing a display presentation of a question and associated answers responsive to the memory means output, further characterized in that the correct one of the associated answers is deducible directly from the display
- 95 presentation of the question. A memory means can be of a capacity for storing a single set of question and associated multiple choice answers, or alternatively can have a capacity for storing a plurality of sets of
- 100 question and associated multiple choice answers. Nonvolatile storage means such as a cassette or disk, can be provided for storing additional question data and associated multiple choice answers data which can be selectively output to and stored in the memory
- 105 means of the video game system. The video game as described can be a coin operated quiz game, or may be a non-coin operated game, for educational or amusement purposes. In the illustrated embodiment, scoring is provided responsive to the number of correct answers, and can be made dependent
- 110 upon the elapsed time taken to correctly answer the present question and/or the number of incorrect choices prior to correctly answering a displayed question. In the illustrated embodiment, means are provided for animating the display presentation of the question, and answer.
- 120 These and other aspects of the present invention will become apparent to those skilled in the art from the following detailed description of the example embodiment, considered in conjunction with the accompanying
- 125 drawings, in which:
- Figure 1 illustrates physical apparatus of a video quiz game as taught in the present invention;
- Figure 2 is an electrical block diagram illustrating an embodiment of electronic circuitry
- 130

for practicing the present invention; and  
*Figures 3-5* illustrate various question and associated multiple choice answer display presentations which can be utilized with the present invention.

Referring now to Fig. 1, apparatus illustrating one embodiment of the physical game hardware is shown. An input console is provided for converting user supplied stimuli to input data signals usable by the video game system. As illustrated in Fig. 1, the input means are comprised of player 1 input apparatus 10, player 2 input apparatus 20, and number of player select buttons 30 (one-player) and 32 (two-player). Additionally, other input apparatus can be provided for converting other externally supplied user stimuli to input data signals for the video game system, such as coin acceptor chute in a coin operated game, and/or other input devices. As illustrated in Fig. 1, the player input apparatus 10 and 20 are of identical construction, each shown containing four player input buttons, a, b, c, and d. Greater or lesser number of buttons can be provided, such as providing full alphanumeric data entry capabilities. The input buttons a-d can be any type of switches, including capacitive touch switches, momentary contact pushbuttons, etc. The buttons 30 and 32 provide for selection of one player and two player games, respectively. The video game system responds to the input data signals generated from these pushbuttons to select the subsequent sequencing of game play as presented on the video display 100. The display apparatus 100 is comprised of a question and answer viewing area 150, score indication displays 100 and 130 for players 1 and 2, respectively, question number display 125, and point value for the presently displayed question display 120. The displays 110, 120, 125, and 130 may be integrated into the question and answer display region 150, or may be separately positioned. In a preferred embodiment, the correct answer of the multiple choice answers is deducible directly from the information provided in the display presentation of the question. Thus, the game user need not be a history or sport or entertainment trivia expert, as no prior knowledge of the question subject area is required to select the correct answer from the choices displayed. As explained in greater detail with reference to Figs. 3-5, a correct answer results in a visual display of positive reinforcement, while each incorrect answer results in a video display of increasingly negative reinforcement. In a preferred embodiment, color graphics animation is utilized both as part of the question and answer choice presentation and as part of the answer reinforcement presentation.

Referring now to Fig. 2, an electronic system for use in conjunction with the illustrated apparatus of Fig. 1 is shown, illustrating one

embodiment of an electronic system compatible with the present invention. An input means 200 is coupled to a control means 210. The input means can be of the nature as with reference to input device 10, 20, 30, and 32 of Fig. 1, and/or may comprise any input means for converting an externally supplied user provided stimulus to an input data signal for coupling to the control means 210. As illustrated in Fig. 2, the control means 210 is shown comprised of a microprocessor 215 and a memory 216. Additional support, control, and buffering logic can also be provided. Alternatively, other control logic means implemented out of discrete integrated circuits can be utilized. The control means 210 provides a control signal output 212 responsive to the input data signal. The control signal output 212 from the control means 210 is coupled to a memory 220. The memory 220 can be separate from or form a part of the control means 210. The memory 220 is a read-write memory for storing and outputting data representing a question and associated multiple choice answers, or a plurality of questions and a plurality of associated multiple choice answers. The data is output from the memory 220 responsive to the control signal 212 as output from the control means 210. The data output 225 from the memory 220 is coupled to a means 230 for providing a display presentation of a question and associated multiple choice answers responsive to the output 225 from the memory 220. The display presentation controller means 230 is coupled to a display 250. In an alternate embodiment, the display presentation means 230 can be contained within the control means 210, and the output 225 of the memory 220 can be coupled to the display presentation controller portion of the control means 210. The resultant display presentation can be either of a static display nature, or can be of an animated presentation type. The display presentation can be made to change responsive to the user's selected answers to the presented questions, such that the display presentation, following the presentation of the question and associated multiple choice answers selections, varies dependent upon the user's response pattern of selecting answers.

In one embodiment, means are provided for comparing the correct one of the associated answers to the input data signal corresponding to a user's answer selection. Further, means are provided for providing a score output for each question having a point value responsive to the means for comparing, and means are provided for accumulating a total score responsive to the score output. The accumulated score can then be displayed, either utilizing separate score indicating display devices, or utilizing the display 250. As illustrated in Fig. 2, the means for comparing, means for providing a score, and means for accumulating

ing a score are included within the control means 210. Additionally, means can be provided for decreasing the point value of the score output responsive to the number of incorrect answers selected by the user and/or the elapsed time between the display presentation of the question and the input of the correct one of the answers. The means for decreasing the point value are included within the control means 210 as illustrated in Fig. 2, but can be comprised of separate control circuitry.

In an alternate embodiment, nonvolatile storage means 240 are provided for storing question data and associated answers data, and for selectively outputting the question and associated answers data for storage in the memory 220. This can either be accomplished via direct interface to the memory 220 from the nonvolatile storage means 240, or may be accomplished by transferring the data via the control means 210 to the memory 220. The nonvolatile storage means 240 can be comprised of semiconductor memory, magnetic storage media, optical storage media, etc. The nonvolatile storage means 240 can be responsive to the control means 210, or other control logic, for selecting when data is to be output from the nonvolatile storage means 240 for storage in the memory 220. Thus, a large number of sets of questions and associated multiple choice answers can be stored in the nonvolatile storage means 240, and selected subsets of the plurality of sets can be selectively stored in the memory 220 responsive to the control logic 210. Thus, for example, the user can, via the input device 200, select certain categories of questions and answers. Alternatively, the control logic 210 can select subsequent sets of questions and associated answers dependent upon the past history of previously utilized question and answer sets. As described above, in the preferred embodiment, the display presentation of the video quiz game system is such that the correct one of the associated multiple choice answers is deducible by the user directly from viewing the display presentation of the question. This feature increases the range of people who can use the system. Through graphical animation and color control, additional ease of user interaction and enhanced user attentiveness are achieved, thereby providing a more entertaining quiz environment.

Referring now to Figs. 3-5, illustrations of display presentations of different question and associated answer sets are shown (less actual colors and animation effects). The question and associated answers illustrated in Figs. 3-5 illustrate the preferred embodiment of the present invention, where the correct answer is deducible directly from the question and answer choice presentation without requiring prior subject matter knowledge.

In the illustrated example of Fig. 3, the user

is requested to select the object which does not belong. Four objects utilizing fire, and one utilizing electricity (the light bulb), choice d, are shown. If the user selects the correct answer, d, the display could, for example flash green, with the lamp of answer d lighting, and the other answers fading out into the background. Alternatively, for a first incorrect answer, a portion of the display could flash red, and the intensity of the incorrectly selected answer could be reduced. If the user then selected a second incorrect answer, the display presentation could flash red, and the incorrect answer objects could burst into flames and disappear. This description is for illustrative purposes only, and other display presentation techniques could be utilized.

Referring now to Fig. 4, another example of a question and associated multiple choice answers, presentation is illustrated. The question presentation asks "how many figures have no hair?". An illustration is provided of a number of people's heads, some with, and some without hair. Four answer choices are given. An example of color animation utilization for correct and incorrect answers can again be provided, as was done for Fig. 3. If the user inputs the correct answer, the display presentation changes to flash the hairless faces with a green color, changing the facial expressions into a smile. On the other hand, the first incorrect answer selection can result in a display presentation of flashing red, reducing the intensity of the display presentation of the selected answer, and causing the lower face to frown. A second incorrect answer can have the same display presentation results as with the first incorrect answer, with the added refinement of doubling the size of the lower face which is frowning. In this way, the display presentation is responsive to and interactive with the user. Thus, direct, real time feedback is provided to the user responsive to his or her selected answers, beyond the reinforcement provided by the scoring. As discussed above with reference to Fig. 2, the scoring provides a separate means of positive and negative reinforcement, decreasing the score with elapsed time from question presentation, and/or decreasing the score for each incorrect answer prior to selection of a correct answer. A fixed number of incorrect answers can be allowed prior to cancelling the presented question and moving to the next question. For example, two incorrect answers can cause zero points to be awarded, the correct answer to be indicated, and the next question and associated answer sets to be displayed.

Referring now to Fig. 5, yet another illustration of a display presentation is shown. The display presentation asks the user to select one of five geometrical segments to complete a rectangle with a segment missing. The user's answer selection, and answer selection history for this question, determine the subse-

quent display sequencing. For example, if the correct answer is chosen, in this case c, the display presentation could flash green, and the correct symbol could be moved to mesh

5 with the block to form a rectangle, while fading out the remaining answers from the display presentation. Alternatively, upon the first incorrect answer being selected, the display presentation could flash red, and the  
10 intensity of the incorrectly selected answer be reduced. If a second incorrect answer is then selected, the display presentation could flash red, the correct answer could be doubled in size and moved to mesh with the block.

15 Additionally, other specific play features could be added to the game. For example, for a coin operated game, an attract mode can be provided on the screen showing different aspects of game operation. Upon insertion of  
20 a coin, a get ready animated sequence could appear on the screen, followed by a "GO" first question indication, followed by a presentation of the first question and associated answers on the screen.

25 As described above, the scoring for each question can be made to decrease with time and incorrect answer selections.

Thus, for example, the main score for each question could start at 900 points and decre-  
30 ment to 0 upon proper conditions. For example, the score for a correct answer could remain 900 points for the first 2 seconds, decrease by 100 points after the next half second, decrease by another 100 points after  
35 the next three-fourths of a second, decrease by 100 points per second after each of the next 3 seconds, decrease by another 100 points after the next one-and-a quarter seconds, decrease by another 100 points after the next  
40 one-and-a-half seconds, and finally decrease to 0 points after another two seconds. Additionally, each incorrect answer could result in the point score for an answer decreasing by 400 points. These point values and time  
45 periods are given for purposes of illustration, and other scoring techniques can be utilized consistent with the teachings of the present invention.

Continuing with the exemplary description  
50 of game operation, the display presentation provides the question and multiple choice answer selections to the user, and displays the maximum score for that question (e.g., 900 points). The player (user) presses the appropriate  
55 answer button of the input apparatus, and the electronic system of the game responds thereto. A correct answer selection results in the selected answer choice flashing green, the player's score for that question flashing, and the decrementing of the score stopping. An associated correct animated display and sound  
60 sequence can be provided as the score is then transferred to the respective player's score in 100 point increments. This provides  
65 positive reinforcement. An incorrect answer

selection results in the immediate flashing of the selected letter in red, an incorrect score sound, and the decrementing of the question  
score counter to 500. A second incorrect

70 answer again results in the immediate flashing of the selected answer in red, decrementing of the score counter for that question to 0, and a sound and animation sequence indicative of an incorrect answer selection. This description  
75 of operation is meant for illustrative purposes only, and is not meant to be taken in a limiting or required sense.

An additional game feature of a bonus question can be provided to reward a pre-  
80 defined number of correct answer selections and/or for a new high game score. The bonus question can be accompanied by an animated display sequence. Thus, where only six questions per game are normally provided, addi-  
85 tional bonus questions can be earned.

While there have been described above various embodiments of a video quiz game for the purpose of illustrating the manner in which the invention can be used to advance,  
90 it will be appreciated that the invention is not limited to the disclosed embodiments. Accordingly, any modifications, variation, or equivalent arrangement within the scope of the accompanying claims should be con-  
95 sidered to be within the scope of the invention.

#### CLAIMS

1. A video game comprising:
  - input means for converting an externally  
100 supplied user stimulus to an input data signal,
  - control means for selectively providing a control signal responsive to the input data signal,
  - memory means for storing and outputting  
105 question data and associated multiple choice answers data responsive to said control signal;
  - means for providing a display presentation of said question and associated answers data responsive to said memory means output  
110 wherein said correct one of said associated answer is deducible directly from the display presentation.
2. The game as in Claim 1 wherein there are a plurality of sets of question and associated  
115 answers.
3. The game as in Claim 2 further comprising:
  - means for selecting one of said plurality of sets responsive to said input data signal.
4. The game as in Claim 1 or 2 or 3  
120 further comprising:
  - non-volatile storage means for storing said question data and associated answers data, and  
125 means for selectively outputting said question data and associated answers data from said non-volatile storage means and for storing said output question data and associated answers data in said memory means.
5. The game as in Claim 1 further com-

- prising:  
means for comparing the correct one of said associated answers to the input data signal corresponding to a user answer selection, and
- 5 means for providing a score output having a point value responsive to said means for comparing, and  
means for accumulating a score responsive to said score output.
- 10 6. The game as in Claim 5 further comprising:  
means for decreasing the point value of said score output responsive to an incorrect one of said associated answers input data signal.
- 15 7. The game as in Claim 5 or 6 further comprising:  
means for decreasing the point value of said score output responsive to the elapsed time between the display presentation of said question and the input of the correct one of said associated answers input data signal.
- 20 8. The game as in Claim 5 or 6 or 7 further comprising:  
means for displaying the accumulated score responsive to said means for accumulating.
- 25 9. The game as in Claim 1 or 2 or 3 or 5 wherein said display presentation of said question is animated.
- 30 10. The game as in Claim 9 wherein said display is a cathode ray tube.
11. A video game comprising:  
input means for converting an externally supplied user stimulus to an input data signal, control means for selectively providing a
- 35 control signal responsive to the input data signal,  
memory means for storing and outputting question data and associated multiple choice answers data responsive to said control signal;
- 40 means for providing a display presentation of question and associated answers responsive to said memory means,  
wherein said display presentation of said question is animated.
- 45 12. The game as in Claim 11 wherein there are a plurality of sets of questions and associated answers.
13. The game as in Claim 12 further comprising:  
means for selecting one of said plurality of sets responsive to said input data signal.
- 50 14. The game as in Claim 11 or 12 or 13 further comprising:  
non-volatile storage means for storing said
- 55 question data and associated answers data, and  
means for selectively outputting said question data and associated answers data from said non-volatile storage means and for storing said output question data and associated
- 60 answers data in said memory means.
15. The game as in Claim 11 further comprising:  
means for comparing the correct one of said
- 65 associated answers to the input data signal

corresponding to a user answer selection,  
means for providing a score output having a point value responsive to said means for comparing, and

- 70 means for accumulating a score responsive to said score output.
16. The game as in Claim 15 further comprising:  
means for decreasing the point value of said
- 75 score output responsive to each incorrect one of said associated answers input data signal.
17. The game as in Claim 15 or 16 further comprising:  
means for decreasing the point value of said
- 80 score output responsive to the elapsed time between the display presentation of said question and the input of the correct one of said associated answers input data signal.
18. The game as in Claim 15 or 16 or 17
- 85 further comprising:  
means for displaying the accumulated score responsive to said means for accumulating.
19. The game as in Claim 11 wherein the correct one of said displayed answers is deducible directly from the display presentation of the question.
20. A video game substantially as herein described with reference to the accompanying drawings.

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